Patients who undergo AlloHCT with isolated CNS relapse have superior outcome compared to those with combined CNS and BM relapse or CNS involvement at diagnosis.

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Allogeneic Stem Cell Transplantation (Allo-SCT) for the Treatment of T-Cell Acute Lymphoblastic Leukemia (T-ALL); Evaluation of Minimal Residual Disease and Prognostic Factors at the MD Anderson Cancer Center (MDACC)

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Introduction: T-ALL represents 20-25% of all cases of ALL, with cure rates of 40% with chemotherapy alone. Allo-SCT can improve survival in first remission (CR1), and is the only curative therapy for patients with relapsed or refractory disease. We performed a review of all cases of T-ALL treated with Allo-SCT at MDACC with the aim of identifying prognostic markers to improve outcomes.

Methods: All patients who received first allo-SCT for T-ALL between 2000-2014 were analyzed. Overall survival (OS) and progression free survival (PFS) were estimated using the Kaplan-Meier method. Cumulative incidence (CI) of relapse (CIR), acute GVHD (aGVHD), and chronic GVHD (cGVHD) were determined utilizing the cumulative incidence method to account for competing risks. Given that disease relapse was the primary cause of treatment failure, we evaluated prognostic factors for relapse using Cox Proportional Hazards regression analysis on univariate and multivariate analysis.

Results: 67 patients received first allo-SCT, with a median age of 31 years (range 2-70), and a median follow-up time among survivors of 35 months. 93% of patients received myeloablative (MA) conditioning, with primarilytacrolimus/methotrexate +/- ATG GVHD prophylaxis (Table) The 3-year OS estimate was 34%, and 3-year PFS was 32%. In patients transplanted in CR1, the OS was 57%, in CR2+, 30%, and in no-response/progressive disease (NR/PD) was 13%. The 3-year CIR was 54%, CI NRM 10% and CI cGVHD 23%. 100-day CIR II-IV aGVHD was 42%. On multivariate analysis, male sex (HR 2.4, p=0.055), and PD/NR (HR 2.9, p=0.003) were the only significant predictors of relapse. Minimal residual disease (MRD) by flow cytometry at transplant was predictive for relapse (HR 2.5, p=0.03) on univariate, but could not be analyzed on multivariate analysis due to low numbers (n=10), though 8/10 patients died of relapse. CR1 vs CR2 on univariate was borderline significant (HR 3.96, p=0.06). T-Cell subtyping will be available at the time of presentation.

Conclusion: We present the largest single institutional study of patients with T-ALL to date. Relapse was the major cause of death in this cohort, with male sex and resistance to chemotherapy as independent predictors of progression, while transplant in CR1 trended to be advantageous for OS. Novel strategies to decrease MRD and relapse post transplant are needed to improve outcomes.

Table

Characteristic	N=67 (%)
Male	49 (73)
Female	18 (27)
Age at Transplant	
</30	31 (46)
>30	36 (54)
WBC at Diagnosis (x10^9/L)	
<100	40 (60)
>100	8 (12)
Unknown	19 (28)
Extramedullary Disease at Dx	
Yes	37 (55)
No	31 (45)
CNS Disease	
Yes	8 (17)
No	5 (87)
Unk	1 (6)
Cytogenetics (SWOG)	
Intermediate	37 (55)
High	2 (3)
Very High	4 (6)
BCR-ABL	2 (3)
Unknown	22 (33)
Disease Status at Transplant	
CR1	21 (31)
CR2+	31 (46)
NR/PD	15 (22)
Donor Source	
Unrelated	29 (43)
Sibling	35 (52)
Parent	3 (5)
Stem Cell Source	
BM	18 (27)
PBSC	42 (63)
CB	7 (10)
TBI	22 (33)
No TBI	45 (67)

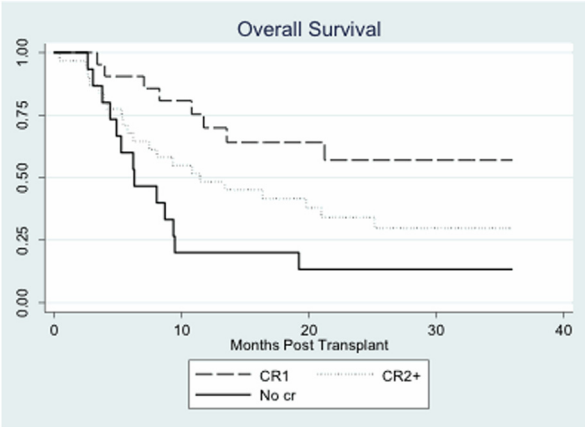

Figure.

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Allogeneic Hematopoietic Cell Transplantation (HCT) Yields Lower Relapse Rates but No Overall Survival Benefit for Adults with Acute Lymphoblastic Leukemia (ALL) in First Minimal Residual Disease (MRD)-Negative Remission

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